

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in or relating to a Method for Forming Screw Threads on a Metallic Tube

We, ETABLISSEMENTS TROUGONAT, a French Body Corporate, of 47, Allée des Charmilles, Livry-Gargan (Seine-et-Oise) France, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of forming screw threads on a metal tube by deformation of the tube material.

According to this invention there is provided a method forming screw threads on a metallic tube by forcing a mandrel into the tube when the latter is held in an internally threaded die, wherein the threads of the die are rounded, and wherein the mandrel includes, in order of entry into the tube, a first part, a second bead-like part, and a third cylindrical body part, the first part having a diameter which increases from its extremity to its meeting with the second part, the second part having a diameter substantially equal to the mean diameter of the tube before threading, and the third part having a diameter less than the second part.

With this device threads of considerable diameter and thickness can be formed on tubular blanks without resorting to any machining step or removal of material, which constitutes a substantial advantage over hitherto known methods.

An embodiment will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is an axial section showing the tubular blank inserted in the die;

Figure 2 is a part-sectional, part-elevation view of the mandrel; and

Figure 3 is a front view showing the tube inserted in the die.

These figures illustrate in diagrammatic form the device according to this invention,

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wherein the tubular blank or tube 1 is held in a die formed with a bore having cut therein the threads to be formed on the tube. This die consists of two longitudinal elements 2, 3 assembled along a common horizontal and diametral plane.

These elements are clamped between the upper and lower plates of a press shown diagrammatically at 4 and 5.

Behind the press a ram or like hydraulic-actuated plunger 6 is disposed, the piston-rod of this cylinder carrying a ring-shaped member 7 in which a mandrel 8 to be force-fitted through the tube bore is clamped. This mandrel comprises a tapered front end 9 merging through a bead 10 into the cylindrical body 11. The diameter of bead 10 is intermediate the inner and outer diameters of the tube before the threading operation and equal to the inner diameter of the tube after the operation. The cylindrical portion has a slightly smaller diameter.

During the insertion of the mandrel through the tube the tube metal is expanded and fills the hollow threads of the die elements, so that upon completion of the threading operation the tube thickness is reduced and the desired threads are formed in relief on the outer tube surface.

The machine may be controlled through electronic or other means so that the press clamping action is produced and then released automatically when the desired press pressure is obtained. The plunger is energized and finally its piston is released or retracted.

By way of example, in the case of a steel tube having inner and outer diameters of 52 and 57 millimeters respectively, a mandrel having a bead 10 of 55 millimeters in diameter is used, the diameter of the leading face of its tapered portion being 49 mm. The die threads are 1.5—mm deep. Upon completion of the thread-forming operation, the inner

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diameter of the tube is 55 millimeters, and the diameter at the bottom of the tube threads is 57.1 mm, for an outer diameter of 60.5 mm measured on top of the threads.

5 WHAT WE CLAIM IS:—

1. A method of forming screw threads on a metallic tube by forcing a mandrel into the tube when the latter is held in an internally threaded die wherein the threads of the die are rounded, and wherein the mandrel includes, in order of entry into the tube, a first part, a second bead-like part, and a third cylindrical body part, the first part having a diameter which increases from its extremity to its meeting with the second part, the second part having a diameter substantially equal to

the mean diameter of the tube before threading and the third part having a diameter less than the second part.

2. A method according to claim 1 wherein the first part is frusto-conical. 20

3. A method according to claim 1 or claim 2 wherein the die is in two parts.

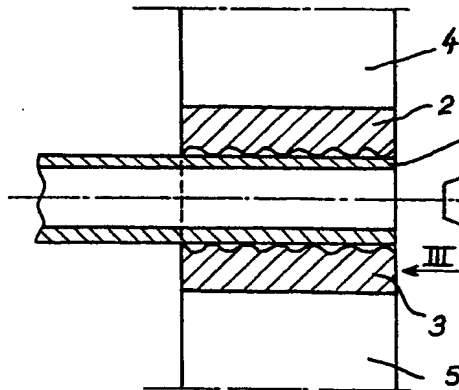
4. A method of forming screw threads on a metallic tube, substantially as herein described, with reference to the accompanying drawings. 25

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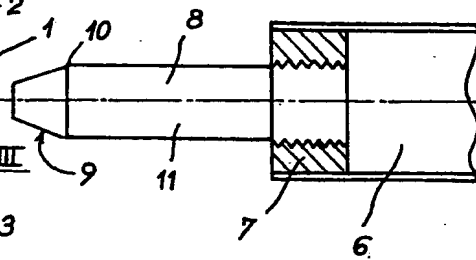
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*Fig. 1*



*Fig. 2*



*Fig. 3*

